

Transport Committee

Oral evidence: [Fuelling the future: motive power and connectivity](#), HC 973

Wednesday 9 February 2022

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[Watch the meeting](#)

Members present: Huw Merriman (Chair); Mr Ben Bradshaw; Ruth Cadbury; Simon Jupp; Chris Loder; Karl McCartney; Grahame Morris; Gavin Newlands; Greg Smith.

Questions 64–108

Witnesses

[II](#): Ed Birkett, Head of Energy and Environment, Policy Exchange; and Dr Nina Skorupska CBE, Chief Executive, Association for Renewable Energy and Clean Technology.

Written evidence from witnesses:

- [Renewable Transport Fuel Association](#)



Examination of witnesses

Witnesses: Ed Birkett and Dr Skorupska.

Q64 **Chair:** Could I ask the witnesses to introduce themselves?

Ed Birkett: I am Ed Birkett, head of energy and environment at the think-tank Policy Exchange.

Dr Skorupska: Good morning, everybody. My name is Nina Skorupska. I am the chief executive of the Association for Renewable Energy and Clean Technology, the AREA.

Q65 **Chair:** Ed and Nina, welcome back. It is always great to get evidence from both of you. We will follow a similar format to the previous panel. Our apologies for running over time. We will ask about the Government's approach first of all, and then we will go into each of the different transport sectors and ask for your views. I will start, and then I will hand over to Karl.

I will start in the same way as I did before. The Government claim to be technology agnostic, but do we need to start picking winners and losers in order to deliver the net zero target by 2050?

Ed Birkett: In general, we want to be as technology neutral as possible to have fair competition between different technologies in the market. One thing that makes it difficult with transport, particularly with fuels, is the need for infrastructure.

The Government are not taking a completely technology-neutral approach, but that is understandable. There are some sectors where it is clear which technologies are winning and which are likely to win—for example, electric cars. In those cases, it makes sense for the Government to invest, in electric infrastructure in that case, because there is a clear, winning technology at the moment.

There are other sectors where that is not the case and it is not clear what the winning technology is going to be, as you have just heard from your previous panel, particularly in aviation and shipping. In those cases, it makes sense for the Government to be more technology neutral, and they are doing that. For example, in the jet zero strategy, you can see that they want to be technology neutral. Also, in the heavy vehicle freight trials that DFT has funded, they have funded both battery and hydrogen freight vehicles in order to keep both of those technologies in the game.

Q66 **Chair:** Going back to that, I think Andy made the point that the Government are not really being technology agnostic. Certainly, if you look at electric vehicles over some of the alternatives, they seem to be putting their investment hat in that direction. Is that a fair description?

Ed Birkett: The regulatory frameworks try to be technology neutral in general. For example, the zero emission vehicle mandate that this Committee recommended would credit both hydrogen and electric



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passenger cars. When you get to infrastructure spending, you need to make some choices because there is either public money going in there or Government regulation saying, "Let's approve spending on these types of infrastructures." It is completely understandable that when it comes to infrastructure the Government have to make technology choices, and so do people like the regulator Ofgem, for example.

Q67 **Chair:** Nina, the same point to you as an opener, if I may.

Dr Skorupska: I think the Government are playing catch-up when it comes to decarbonisation of transport. It has been the poor relation in terms of tackling the emissions from it. Where the Government have put their focus on decarbonising the power sector, we have seen some amazing headway.

Of course, the road debate between the different categories of vehicles has the additional pressure of the concerns around air quality and things that come out of the tailpipe. There has been a hand-in-hand coming together of technology development for electric vehicles for roads—domestic and light commercial vehicles—and the requirement in cities to reduce urban pollution from tailpipe emissions. Of course, the whole aim really needs to be around reduction of greenhouse gases.

I agree with Ed about the other areas, about aviation. I sit on the Jet Zero Council as well, representing renewable transport fuels and the electrification side of things. We are only just getting going on considering them. The choices that the Government may be thinking about are about the turnover in the assets that need to be decarbonised—the life of a particular vehicle. For a car, how many years does it last? An aeroplane, a train or marine are assets that are there for a long time. The focus for aviation, marine and rail—other than for electrification of rail—may be on drop-in fuels, but at the same time in parallel bringing on the idea of innovation, which should be appearing later in the 2030s.

We have argued that the focus needs to be about what needs to be done in this decade, as well as what can be delivered in future decades. Electrification on roads is clearly the way forward. We are grateful for having that mandate now. A mandate suddenly causes various sectors to start to shift, prioritise and find their own means of investment as well. Everything is still quite nascent in these transitions. The rules, the regulations and the coming together of different sectors is the difficult nub of what needs to be resolved today.

Chair: Thank you very much both of you for the opener. Let's stick on this theme before we go through the modes of transport. Karl, I will bring you in now and then on to Greg.

Q68 **Karl McCartney:** Nina, you have just said that it seems, from your point of view, that electricity is the way forward on the roads. Some of us might counter that. Specifically, what alternative fuels, taken in the



round, offer the greatest potential to reduce emissions, considering that electric vehicles need to have their energy produced somewhere?

Dr Skorupska: We believe that there is a range of solutions in terms of decarbonising transport on road. As I say, there is a distinction between the different classes of vehicles. We have had the discussion before about cars and light commercial vehicles, and the direction of travel and the investment piece there supports an electrification route. This year and next year we will be seeing far more models of cars coming on to the market, but it is still early days on that. The infrastructure—

Q69 **Karl McCartney:** You sat in on the previous session, and you heard what was said before. Do you accept that there are potential benefits of current internal combustion engines using synthetic fuel rather than fossil-based fuel?

Dr Skorupska: It depends on what the use of that vehicle is. For sure, we have to be able to provide, for instance, farm-based vehicles or other design of vehicles. So many new designs are coming on to the market that we have never considered before in the way of transporting goods. For heavier goods vehicles, we have members who have really been supportive of the development of bio-methane, synthetic fuels, and utilising all of our infrastructure in order to accelerate the decarbonisation of them.

There is a range of fuels that are appropriate for different uses. If we are talking about mass domestic cars, we cannot say now that electrification is not going forward as the main method of powering them. We have a mandate now that new vehicles, post-2030, will no longer be internal combustion engines or fossil-fuel based.

Q70 **Karl McCartney:** I have the same question to you, Ed. Do you think that the majority of the 35 million vehicles on our roads are going to be electrified?

Ed Birkett: In terms of passenger cars, absolutely. The point you made earlier about classic cars is a good one. In that case, it does not necessarily make sense to change the drivetrains. Synthetic fuel might be an option although, to be honest, it is the opposite of the low-hanging fruit in terms of carbon emissions reduction. I would be perfectly comfortable with classic cars continuing to use conventional petrol for the foreseeable future because the emissions are very low.

Efficiency is something we have to be very careful about when we are talking about different fuels. Transport & Environment did a study that found that with electricity produced from, say, a wind farm or a solar farm for battery vehicles, the round-trip efficiency to the wheels was 77%. For hydrogen fuel vehicles for green hydrogen, it was 30%, and for synthetic fuels, power to liquids, 13%. I think it could be a bit higher than that, from talking to Paddy earlier. We have to be aware of that efficiency and what that means for the economics.



Q71 Karl McCartney: What happens if the electricity was produced at a gas-fired power station, or indeed a coal-fired power station? I am sure there will be very interesting stats then. Do you have those?

Ed Birkett: This is just efficiency. This is not emissions reductions. The way that we are going in the UK now, in terms of lifecycle emissions from battery vehicles, is that they are significantly lower than internal combustion engine vehicles. It is either half or two thirds lower, and that is a very good result.

Dr Skorupska: May I come back a little bit? I think it is about the parallel track that is also happening. I gave evidence at the Department for Business, Energy and Industrial Strategy about the ambition to decarbonise the power grid; there is a stated ambition to do that by 2035. We think that, if that is accelerated, we could see that earlier, around 2032, in the view of our members who are involved in renewable power generation capabilities, both decentralised and large scale.

The other ambition of the Government is to add in future carbon capture usage and storage on any remaining gas-fired power stations, therefore decarbonising that too. It is a dual track. We know, if you look at our power decarbonisation levels today, that they are tracking over 50% in the last years from renewable energy. It will not be long before it is over 50%, given the delivery and the plans that can be brought to bear.

I want to come back to the biofuel side of things, E5 and E10. It took nearly five years to get E10 pushed through and delivered. I think E5 is going to be the preferred fuel as the constant fuel on forecourts. As we see more electric cars—

Q72 Karl McCartney: I think you probably meant E10 then, didn't you? I do not want to put words into your mouth. Did you mean E10 is going to be preferred or E5?

Dr Skorupska: I am trying to find the right word that my colleague mentioned to me. E5 is the preservation fuel on the forecourt, so there will be that option.

The point I wanted to make is that, as more electrification continues, we would argue that we should start to increase the proportion of biofuels that are produced for decarbonising the requirements of the fuel for internal combustion engines, so going beyond E10 to E15, E20 and E30. We can see that dual approach in being able to decarbonise road transport.

Q73 Karl McCartney: With older vehicles, I am certainly more inclined to use E5 for the power outage and also for the fact that it gives you more miles to the gallon than E10. If you are going down the route of E15 or E20, there is going to be even more damage caused to current internal combustion engines. There will be fewer miles done per gallon, so the economies of scale mean that those of us who take that decision will carry on wanting to use E5 even if it does cost a little bit more because



the benefits are there in the mileage that you receive per gallon.

I am conscious that my colleague is going to come in next, but I quickly want to make the point—I am sure you both agree—that building new cars costs energy as well. None of us wants to see 35 million vehicles scrapped at this point in time, do we?

Dr Skorupska: Of course, nobody wants to see 35 million cars scrapped in one year, but this is about a transition. It is also about decarbonisation. There has to be a balance. Where we give evidence, it is about how we do that in a way that is beneficial for addressing climate change but also allows people to bring forward and enjoy the different choices that they want to pursue.

Q74 **Greg Smith:** Good morning to you both. I will first ask a question that I asked the first panel. Whose job is it to decarbonise transport? Is it the primary responsibility of the Government, or is it actually one where, with a lot of innovation, predominantly in the private sector, the market will prevail and produce a winner?

Ed Birkett: I think there are clear roles for both the Government and the market. The Government have a really big role in setting the regulatory framework—the renewable transport fuel obligation and the UK emissions trading scheme. The Government have a clear role in R&D, in partnership with the private sector. The Government also have a clear role, as I said earlier, in infrastructure. Decisions on infrastructure cannot just be taken by the private sector. There has to be standardisation either within the private sector or with the Government helping and potentially putting in money.

We have also seen the Government putting in money to ensure that the factories are built in the UK. That has been a really positive trend in the last few years. We have been seeing offshore wind factories in the UK and battery gigafactories in the UK. That is a really positive trend.

There is a massive role for the market in scaling up and deploying these technologies. If you look at what has happened to solar panels and the cost of batteries, that is not the Government sitting there telling people what types of batteries to make. That is hard-fought competition in the private sector bringing down those costs at a staggering rate. We need to see the same thing in alternative fuels.

Dr Skorupska: I cannot disagree with the points on the role of Government. If we are now committed to deliver a net zero future by 2050, there has to be a regulatory framework, an approach and forms of support at appropriate times to position the UK to be a world leader. At the moment, if we just look at renewable transport fuel, only 12% is produced in the UK. The rest is imported, and the majority of that fuel is coming from China. Why wouldn't the UK want to take a leading role and set up the capability to produce the different types of fuel in that, and play a leading role internationally?



We need good regulation, but we also need regulation that is fit for purpose and drives the right agenda. As you can see, in the energy market at the moment regulation is falling a bit behind on setting the right framework that we need, not only on what is being developed here in the UK but internationally. Technology is developing so far in that capability, particularly non fuel-based technologies, that we are trying to bring the Government right alongside to say, "Come on, let's get this sorted"—for instance, in distribution network operations, in electrification of all the various transport schemes that we want to progress. That infrastructure and that support is a clearly a role for the Government.

Q75 Greg Smith: Thank you very much. I hesitate to get into the energy market on this, but there is equally a case that some of the regulation caused the problem as well, but that is a different topic.

Ed, you mentioned the renewable transport fuel obligation in your answer. Is that working? Does it need some reform to make it work better?

Ed Birkett: It certainly needs some reform to make it work better. It seems like a reasonably good policy, to be honest. A lot of care has been taken to ensure that we are getting the right outcomes in terms of greenhouse gas reductions and making sure that we are not harming biodiversity—for example, by having palm oil grown on cleared rainforests and things like that. It is a good obligation and it has been iterated a number of times, which is really important going forward.

The Government are looking now at their low-carbon fuels strategy. There was a call for ideas published two days ago. I think that will be the first part of it. The key question for that strategy, and for this inquiry in general, is how the renewable transport fuel obligation interacts with carbon pricing in other sectors—for example, the UK emissions trading scheme. We are now having a link between the electricity sector and fuels, say, for example, the green hydrogen that Paddy will be putting into his synthetic fuels. You need to understand how those two sectors are linked.

I am a little bit worried about the renewable transport fuel obligation when it comes to something like green hydrogen. There are some very complex rules around how that hydrogen is counted as green, whereas there might be a way to simplify that by just having a broadly equivalent carbon price in both the emissions trading scheme and the renewable transport fuel obligation, which means that you then have to worry less. You would have a level playing field without having to worry too much about it. I think that is really important.

In addition, the Government said they want the UK emissions trading scheme to be net zero aligned. The renewal transport fuel obligation is effectively an emissions trading scheme for fuels, so the same logic applies. If our ETS is to be net zero aligned, the RTFO should also be net zero aligned. I think that is something the Government should look at.



Q76 **Greg Smith:** That is incredibly helpful. Nina, do you have a view on that?

Dr Skorupska: I do. It has been a very valuable instrument to set that obligation on suppliers. One of the perverse things that it has not done is to ensure that the fuel is produced in the UK. It allows importation of fuel from a whole range of countries, as I said. Some of that aspect of it has not been optimal for positioning the UK as a world leader.

If we want to use a similar instrument going forward, we advocate that we need another decade added to the RTFO period. It expires in 2032. If we want to continue to drive forward decarbonisation of fuels, we need that longer-term signal, as well as other forms of support mechanisms to enable that to happen. I agree with everything that Ed said around greenhouse gas accounting. It needs adjusting to really drive towards the net zero position.

Ed Birkett: I missed in my answer that one thing that is good about the renewable transport fuel obligation is that it takes into account the emissions when fuel is produced overseas. That is something we do not have in our emissions trading scheme. In effect, the RTFO already has a carbon border adjustment mechanism, which we need in our emissions trading scheme. That is one reason why you should not necessarily merge the RTFO into the emissions trading scheme. You might end up losing that very important border adjustment, where you are taking into account the imported emissions. You might also lose some of the measures that we have in place to protect biodiversity and ensure that we are not chopping down rainforests to make renewable fuel.

Greg Smith: That is very helpful. I am mindful of the clock, so it is probably time to move on to road.

Chair: I am going to bring Ruth in for the general section, and then we will go to road with Karl.

Q77 **Ruth Cadbury:** I have a similar question to the one I asked the previous panel. Picking up on where you think there are times and places for regulatory incentives, and targeted and focused support towards decarbonisation, are there examples in other countries with equivalent economies that have used such measures effectively to kick-start transport decarbonisation?

Dr Skorupska: The one I was discussing with my colleagues yesterday in preparation for this is Germany, which is really focusing on the delivery of e-fuels. They are betting on that, not necessarily for—

Q78 **Ruth Cadbury:** What sort of things are they doing?

Dr Skorupska: It is around the renewable transport fuels not derived from biological backgrounds, from the hydrogen sphere or from other aspects of recombinations. They have set up schemes to do that, but I do not know about it in a lot of detail. We can provide that and follow that through.



Obviously, we see different economies backing a hydrogen car. Most international focus for transport in domestic and light commercial vehicles is still a battery electric vehicle approach and standards being developed, with understanding and challenges around those areas. For the UK to be very different and not look at broader options but understand where the prevailing direction of technology is going would put us at a cost disadvantage. Here in the UK, we are investing in battery manufacturing now. There is quite significant support and commitment going forward.

Q79 **Ruth Cadbury:** Do you have anything to add, Ed?

Ed Birkett: There are two examples we can look at. For a similar fuel system, you could look at California with their low-carbon fuel standard. That covers quite a lot of their transport demand. It has a very strong, very high, price signal. It also includes negative emissions, so you can get credits for sticking carbon in the ground or for making zero-carbon jet fuel. The developers of those kinds of technologies are looking at California for somewhere they can sell their credits.

Secondly, in the UK we should look at other sectors and at what we have done in electricity. In electricity, we have had an overarching regulatory framework, the emissions trading scheme which hits every technology. We then had targeted innovation and investment support through the contracts for difference regime and some of the grant programmes for things like offshore wind. We are now seeing it for floating wind. That has been a relatively successful combination of measures.

When we come on to the aviation section, you can certainly see the argument for both a mandate for sustainable aviation fuel and a CfD to get innovation and domestic production.

Ruth Cadbury: Thank you very much.

Chair: Let's go into our modes of transport now. We will start with road, and Karl McCartney.

Q80 **Karl McCartney:** I am going to come to you, Nina. But because we were discussing something, I am going to carry on from where we were just a short time ago, so, Ed, will, or possibly could, synthetic fuels specifically, or alternative fuels per se, displace or replace the use of leaded petrol in cars and heavy goods vehicles by 2050?

Ed Birkett: I think it is relatively unlikely that we are going to see widespread use of synthetic fuels in the road sector, as we were talking about earlier, just because efficiency is so low. It really is a premium fuel. You could certainly see it in your classic cars where small amounts of fuel are being used. Hydrogen seems like a better option for modes that cannot be electrified because it has better round-trip efficiency and because you do not need to capture CO₂ out of the air as well as capturing hydrogen in order to make that fuel. I think there is a strong case to say that the role of synthetic fuel in road transport will be limited.



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Q81 Karl McCartney: This is to both of you, but maybe I will stay with Ed. Given the expense of setting up charge points, not just in rural areas but anywhere—but specifically in rural areas—would you say that adopting electric vehicles is the best approach to decarbonising those areas' road transport?

Ed Birkett: Which areas in particular are you thinking about?

Q82 Karl McCartney: Rural areas in the UK, maybe even Scotland.

Ed Birkett: For cars, I am not too concerned about the rural areas problem. If you are in a rural area you are more likely to have a parking space, or will be able to park on land near your house, so you can charge at home using your domestic supply overnight. But there will be a need for a small number of rapid charge points, and Policy Exchange has argued that there should be targeted Government support in those areas. I think that problem can be overcome for passenger cars, absolutely.

Q83 Karl McCartney: Do you not think that there is a role for alternative fuels and synthetic fuels perhaps, or different approaches to road decarbonisation in rural areas? You just think it is straight electricity and EVs all the way?

Ed Birkett: It is hard to see. The Government can set up technology-neutral frameworks, and the zero emission vehicle mandate is in some way technology neutral because it allows hydrogen. When the Government are spending their pound notes on infrastructure, at the moment it is hard to see how you could make a business case for that being in rural hydrogen refuelling stations, for example.

Q84 Karl McCartney: In your view, should the Government be encouraging the uptake of other alternative fuels that are compatible for cars to be considered in rural areas, or do you think the Government have got it right by saying that EVs are the way forward?

Ed Birkett: I do not think that is a high priority. To be honest, if we got to a point where there were certain rural areas where you could not get enough electricity, I would probably rather just stick with petrol and not worry too much about the small residual emissions. We are not that big a country in the UK. We do not have that many extremely remote areas that are so far away from the electricity network.

Q85 Karl McCartney: That is an interesting view. Nina, do you want to answer those points? I can repeat them.

Dr Skorupska: I am happy. Another taskforce I sit on is the EV Energy Taskforce, to look at marrying up and making sure that EV charging infrastructure is focused, rolled out and works with local authorities as we go through this decade, and understanding the value to the consumer overall of the business models, and the tensions that are occurring. As we see, car manufacturers are saying that there are not enough EV charging points. The EV charging infrastructure, which I represent, is saying that



we need clarity and to work with local authorities. The distribution network operators also need to wake up. All of this is coming together.

There is work at the moment, which you might want to link into for further evidence, in the EV Energy Taskforce on what is the minimum viable product. That would allow people not to be worried about range anxiety. It would feed back some of the information on behavioural change that is happening with people who are now currently EV drivers. It is a very different prospect and model. It is about destination charging. What is the role of the village hall and seeing that as an income opportunity? I use it as a very light-hearted example, but those are the kinds of conversations going on in parish councils, including mine in the heart of Devon. They are looking at those opportunities.

We see destination locations like public houses discussing what should be the charge rate for an electric vehicle if it comes to visit and enjoy the hostelry. Should it be slower-rate charging so that they will stay for a three-course meal, or a rapid charger because that means they might nip off after one course or a small bit of imbibition? The creativity at the moment in bringing forward the practical and new business models that are emerging is quite remarkable. I have not even thought of half of them; I really have not.

Q86 Karl McCartney: I have a final quick question to both of you. You have both raised charge points and the probability that the worry or anxiety about the number of those will be negated at some point in the near future. Do you both believe that there will be enough electricity in this country to provide those charge points with the energy they need for the number of vehicles that are going to be electrified, if your scenario comes to pass?

Dr Skorupska: The modelling that the National Grid ESO has done, and the Department for Business, Energy and Industrial Strategy, indicates that we will need double the amount of power. It is also understanding which power stations will be retiring and what will be built. It is because we know there is a challenge that we will rise to it. We have not yet fully taken the opportunity of having a decentralised energy supply.

I read an interesting statistic. We worry that so many solar farms have taken up our landscape in the UK. It is a small fraction compared with other areas. Carbon Brief put a nice little thing on Twitter. I recommend it for you to see.

It is about looking not at where the power solution is today, but at the opportunity and range that we can provide to homeowners and businesses, as well as providing centralised sources like offshore wind and others.

Ed Birkett: Overall, I do not think that the supply of electricity is something that should keep us up at night relative to some of the other very big challenges that we have for net zero. What I would say is that



we need to crack on with the charging infrastructure. We need to see the Government's charging infrastructure strategy. We need to make sure that we have enough rapid chargers in rural areas, as you mentioned.

Chair: Thank you. We move from the road to the air. Simon Jupp will lift us off.

Q87 **Simon Jupp:** Good morning, panel. In your view, when we talk about the adoption of alternative fuels in aviation, what barriers do you feel are in the way for the aviation sector to adopt different fuels in the future? I will come to you first, Ed.

Ed Birkett: In terms of drop-in fuels—the fuels that can work in existing aircraft—it is mainly a challenge of cost. Those fuels are more expensive than the existing fuels. Then we are thinking about different fuels, not drop-in fuels but hydrogen, for example. We are talking about a massive infrastructure challenge and making sure that there is a globally co-ordinated infrastructure—for example, initially on key routes. I think those are the challenges.

Q88 **Simon Jupp:** Nina?

Dr Skorupska: Again, drop-in fuel is a cost, but it is also having the investment and the right support mechanisms to ensure that the UK can be a leader in this. It is exactly what you heard from Neville in the previous panel. We know the technologies to make these different types of fuel. Members and organisations who previously provided renewable transport fuels for another sector are investigating and pivoting to see whether they can now support aviation because of the Government's desire and intent to decarbonise aviation.

Hydrogen and the cost linked with that is an infrastructure challenge. Interestingly, we have members who have been involved in logistics in fuelling our airports. They need to see clear signals about what they need to bring to bear to make the transport hub solution the appropriate solution for the UK, whether a major airport or the small rural ones. It is cost and infrastructure. I cannot argue any other.

Q89 **Simon Jupp:** Let's focus on the infrastructure for a second. The last panel, for example, talked about sustainable aviation fuels being seen as the widely more popular option going forward, but there are alternatives with electric flight, as well as hydrogen-based. You are right that it requires other countries to play ball as well.

We have seen how other countries have come together over COP26 and discussed and talked about strategies to make life and travel greener. There are a lot of barriers in place at the moment. Even if we decide to go down the route of supporting electric or hydrogen, for example, it does not matter where you end up at the other end of the flight; if the infrastructure is not there, you are on a hiding to nothing. Do you think that we are anywhere near solving that, or even having proper discussions with other countries about the challenge?



Dr Skorupska: From the conversations I have been having on the council, we know that you cannot unilaterally decide to go down a particular technology. You are quite right. The whole mode of transport is that you are going from a departure to an arrival in another country, or another location, so there has to be collaboration.

Some aspects of the European Fit for 55 are looking at a number of countries and nations and how they are going to grasp that nettle. Are we there yet? No, but the dialogue has to continue to progress. That is why SAF—sustainable aviation fuel—as a drop-in fuel seems to be the first approach. It is something we know, and other countries have been pursuing it longer than we have, to be honest. We need to play catch-up in those areas.

Q90 **Simon Jupp:** Ed, what more could the Government do to provide a bit more clarity on the way forward from their policy point of view on aviation fuel? Are there steps that the Government could clearly set out that would help the industry, and policy in the future?

Ed Birkett: Yes, there is a lot that the Government are already doing. They said in their jet zero strategy that they want multiple technology pathways and to keep those open. That is an important signal for the R&D side of things. They have also said, in terms of deployment, that they are looking at a SAF mandate—a sustainable aviation fuel mandate—so that you can see a clear policy for deployment. I think that is fine. You have a clear policy on deployment, which is around SAF, and then you have a clear policy on innovation, which includes both SAF and hydrogen.

Q91 **Simon Jupp:** How long can the Government keep up the idea of being so wide in their view on this? Of course, R&D is important but at some point the Government have to come down on one side or the other, don't they?

Ed Birkett: Yes, and we have seen that with passenger vehicles, where we have now come down fairly firmly on the side of electric cars rather than hydrogen cars, in terms of the infrastructure investment that the Government are putting in. I do not know the exact date when that will be possible, but at the moment we do not have large-scale hydrogen jets in the air, so it is not necessarily a problem that we have to face at the moment.

Q92 **Simon Jupp:** More widely, of course, over the last two years the aviation industry has been decimated by the impact of Covid, not just in this country but across the world. How far do you think that has set back progress in this area? I think the whole industry is keen to go green but has significantly less money to invest in it itself.

Ed Birkett: I am not an aviation specialist, unfortunately, so I cannot speak for the fortunes of the whole sector. What I would say is that the investment in sustainable aviation fuels will not necessarily just come from airlines or airports. It is coming from private sector businesses like fuel suppliers.



Q93 **Simon Jupp:** There is buy-in required though, isn't there, from airlines and airports, and with cash depleted that has an impact on progress, doesn't it?

Ed Birkett: It does. It is a relatively dangerous time at the moment. There is a risk of other hub airports becoming more attractive than those in the UK, for example, if we were to go too heavy on this regulation and raise costs too far. That is definitely something we need to be mindful of, particularly because of the risk of carbon leakage and redirecting flights. It is probably more than in the other sectors we are talking about today.

It is the old chestnut of having to have a balanced approach. We cannot go too fast. The Government are pretty clear that they want to do something on a SAF mandate. The argument for a SAF CfD is a reasonably good one. It tallies with what we have done in the electricity sector. I think there is a relatively clear path forward, at least in the next few years of policy development.

Q94 **Simon Jupp:** Nina, do you have anything to add on that point?

Dr Skorupska: Listening to some of the conversations of my colleagues on the council, I think all the airlines are aligned around, "Let's get going and let's support sustainable aviation fuel as a drop-in fuel in the first protocol." They were also very pleased to hear of the research that is being done on electrification for smaller aircraft.

In terms of the challenge the Prime Minister set over two years ago for a major commercial equivalent flight across the Atlantic and what it would take to do that, at the moment the leading view is sustainable aviation fuel. Setting the mandate of 10% by 2030 on the fuel starts us on that journey. That gives fuel producers the confidence to look at building up capability after kickstart grant support, and then we will need the contracts for difference, as volume increases, and then, hopefully, the costs will come down. It is still about making a fuel and using resources. They will always have a challenge about getting those costs really down.

Ed Birkett: I want to come back to the question the Chair asked in the previous session about why we don't rule out electric. The answer is that the economics of electric are improving all the time. If we look at the development of batteries for trucks, for example—very high-powered density batteries—that is the sort of technology that could be used in aircraft.

There will have to be big infrastructure upgrades at airports anyway for electricity for ground vehicles. Some of that could also be used by short haul or even regional electric. I wanted to come back on that.

Simon Jupp: I appreciate the clarification; thank you.

Chair: I was going to bring Gavin in, but I am minded to come in now that you have given me the opportunity. Sorry, Gavin. You go first.

Q95 **Gavin Newlands:** It seems a good segue because my local airport,



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Glasgow, has just announced a 30-acre solar farm that is going to produce 15 MW. That is enough electricity for 20% of the houses in Glasgow, which will obviously help the airport decarbonise. Is that something we will have to see from all airports very soon for the potential to feed electrolysis or a SAF plant at the airport?

Ed Birkett: I used to be a solar farm project developer, so I am always keen on solar. There is a balance about putting solar farms in areas where there is going to be the most sun, which is not Scotland. From a pure physics point of view, the angle is lower if nothing else, if not the clouds.

There is a balance between putting the solar farms further south and having the power cables coming to the airport. The primary focus should be on getting the cables to the airport. There may be a case for on-site production, but you have to look at it on a case-by-case basis.

Q96 **Gavin Newlands:** The main question I wanted to ask is this. There are some laudable aims in the Government's plans, but is there enough urgency in the Government's actions?

Ed Birkett: The commitments we have at the moment will not get us there. There are a lot of commitments to consult and implement. It is really about how those happen. There were very positive moves. For example, the zero emission vehicle mandate for cars is a really transformational change and was in the decarbonisation plan.

Q97 **Gavin Newlands:** Do you think they need to get a bit of a move on? I do not want to put words in your mouth, but—

Ed Birkett: Well, the Government know that. Their SAF mandate is going to be out for consultation. It depends on what the parameters are in that.

Q98 **Gavin Newlands:** Do you disagree with that, Nina?

Dr Skorupska: It is not fast enough. That is just my point of view. There are other things that are deflecting the Government's interest at the moment. After COP26, we brought out a whole plethora of strategies. Taking all our members through all of those was great. There was hope that, come 2022, we would start to see some clarity and a consistency of approach. I know that we are only at the beginning of February, but we have to get on with these things, whether it is expressing a mandate that allows the sector to align and know that this is serious, or getting the regulatory framework for aspects like planning, funding, infrastructure and clarity. All of those things now need to align. We need an agile approach for delivering net zero now, using an analogy from the tech sector.

Q99 **Chair:** Ed, do you want to come back briefly? I want to stay on modes of transport.

Ed Birkett: One thing I would say, in terms of the Government commitments, is that there is a very large number of commitments.



Some of them are very impactful; some are much less impactful. There is only a certain amount that the Government can do at any one time, so it would make sense to focus on a smaller number of bigger interventions that are more technology neutral and cover more technology in more sectors. I think that would be the right way to progress, and would probably end up leading to lower costs because you have more competition.

Q100 Chair: Thank you. The point I was going to make, Ed, and that you raised, is that I am struggling to understand the Government's approach on sustainable aviation fuel. It exists right now as a product. It works. It is being used. It also deals with a lot of waste that we can then recycle. It has that to it. The other alternatives in hydrogen and electricity may have something to add, but they do not currently work. We have a contract for difference market that could be replicated from the electricity sector. The burden on this would be in the aviation sector as well. Why do the Government seem reluctant to back it? It seems that in the States they are getting a lot more backing. What is the cloud that has descended over the Government's face on this?

Ed Birkett: With the caveat that I am not an aviation sector specialist, I would say that even though these mandates are fiscally neutral they are not cost neutral for the sector. You have high risk of leakage, with hubs in the EU, hubs in Istanbul and hubs in the middle east taking some of our business. We really have to be mindful about the costs that we put on business. That does not mean that we should not crack on with this stuff, but it does mean that we need to be careful where we set the short-term ambition and how the costs are recovered.

Q101 Chair: That is the thing, because if we do not have a SAF market in this country and SAF becomes the way forward, people will not fly here in the same way. They will fly to the hubs that actually have the SAF capability to put—

Ed Birkett: That is the balancing risk, yes. There are very good arguments that we want SAF production facilities in the UK, adjacent to our existing refineries, and the expertise and the jobs that we want to secure there. There is a very good case for some sort of investment support for that, which the Government have recognised but have not yet handed out.

Chair: They talk about it but do not seem to be putting it in action in terms of the CfD market. I digress. It is time to go on to maritime. Grahame Morris will start us on this section.

Q102 Grahame Morris: I know you are not expert in the maritime sector, but we are looking at all the various modes. Could you give us your view about the progress that could be made, and can be made, in the maritime sector? It is quite a huge sector. There are the short-sea ferries, and we heard about the 300 tankers that BP operates. Potentially, it could play quite a key part in our overall target.



Dr Skorupska: As a trade association, maritime has been late coming to sit at our table, because they want to learn about decarbonisation for the other forms of transport. The focus has been on research for new ships and what they can be adapted to. It is really pleasing to see announcements from Maersk and others who have come forward and said, from a maritime perspective, "We are on track and we want to decarbonise everything."

Again, it is about drop-in fuels in the first instance, the use of ammonia, hydrogen capability and hybrid solutions, mixed with solar sails and other aspects. At the moment, I do not think we have settled on what the answer is. It is all about cost. The shipping market is complicated. A major cargo ship could still be on the high seas for multiple decades. How do you regulate that in getting change to be driven forward?

- Q103 **Grahame Morris:** Even short-haul ferries have lives of 25 years. I want to ask you about how we see progress within the sector. How will the extension of the renewable transport fuel obligation affect supporting fuels of non-biological origin? Ed said that we do not want to be chopping down the rainforest. In terms of the shipping sector, how will that support the maritime industry to decarbonise?

Dr Skorupska: It is about looking at how we create those types of fuels and set up a scheme that supports development for the scale of the volumes that we will need. At the moment, I cannot pinpoint what the appropriate method would be. Again, a mandate would be the first trigger to secure a requirement that a certain amount of the fuel is replaced. It would drive production further forward.

- Q104 **Grahame Morris:** On the mandate, should the shipping sector—the domestic maritime sector—be included in the UK emissions trading scheme?

Dr Skorupska: That is a really good question. It is not one I have looked at, but, from a sense point, to make headway I think they should be.

Ed Birkett: On that last point, I think with the maritime sector we have to think about whether it sits better in the renewable transport fuel obligation or in the ETS. I would caution about trying to put it in both. As I was talking about earlier, we want to try to have equivalent carbon prices broadly in those two markets. We should be looking at which one they fit in, rather than both.

Grahame Morris: Thank you.

- Q105 **Gavin Newlands:** Earlier, you spoke about contracts for difference in the energy market and the cost being passed on to the consumer. Thinking of the cost of decarbonising maritime, particularly ferry, passenger and freight transport, when you look at the Scottish Islands for instance, obviously a lot of those are lifeline services to and from the mainland. Should the cost of decarbonisation be passed on to the passenger, or should there be some other method of paying for it?



Ed Birkett: The new CfDs certainly should not be put on to people's gas and electricity bills. I know that is not quite what you are asking, but it is one thing that is sometimes mooted. I think we have probably reached the end of putting other sectors on to electricity bills.

In the ferry example that you give, I think it makes sense to put the obligation on whoever is operating the ferry because it helps them make the right decision about what fuel they are using. Whether or not that is passed on to customers or not depends on how things are subsidised. I do not know to what extent the ferries are subsidised in the same way as some of our air routes are. If they are subsidised, it is fine to increase the subsidy through the public service obligation, but then still to have the obligation on the ferries because the obligation helps the ferry operator to make the right choice. The public service obligation, if there is one, is there to make the price affordable for the customers.

Dr Skorupska: I could not add more to that comment.

Chair: Thank you very much. Our final transport mode is rail. We will start with Ruth Cadbury.

Q106 **Ruth Cadbury:** As we have heard, rail is furthest ahead in terms of electrification and therefore, in a sense, decarbonisation, although there are still real challenges for some aspects, particularly freight. Should electrification of the whole system be the panacea, particularly as that will present challenges, and should that take priority, or should the focus instead remain on the other transport sectors like aviation and maritime? Which should have priority for decarbonising?

Dr Skorupska: It is an interesting question. Which should be the priority? For me, it is a "both/and". As we heard from the last panel, we are trying to move more things off roads on to rail, and to see the larger benefit from a greenhouse gas reduction, we need ongoing electrification of all of our rail systems as far as we can extend it. Other nations are benefiting from this now. We need to catch up. That is about as much as I can say. Obviously, drop-in fuels for biodiesel and for lines that we will probably never electrify also needs to happen.

Ed Birkett: In priority over other sectors, we see a clear trend. In the short term, what we are trying to do is blend a higher proportion of biological, low-carbon fuel into diesel, for example, and petrol. That could then affect the rail sector. In the long term, it is quite clear that we want to be using biological fuels predominantly in shipping and aviation.

On electrification, Network Rail published their traction and decarbonisation strategy back in 2020. I can quote one statistic from that. There are 15,000 km of unelectrified track in the UK at the moment. Their strategy, which they published in 2020, said that 75% of that should be electrified. The strategy that Network Rail was setting out, and which the Government have not yet committed to, was to electrify 75% of the unelectrified track length in the UK.



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Ruth Cadbury: Thank you.

Q107 **Chair:** Does anybody else want to come in? I want to ask a little more about rail. It is a good one to close on. Our recommendations suggest that at the moment electrification is the only game in town, particularly when you take freight into account—to Greg’s question. Yet, if we do not actually crack on with rolling electrification, first, we will not get to the 2040 target that the Government have set rail for decarbonisation. Secondly, we will not drive the price down. It is about five times as much per kilometre/mile to deliver electrification in the UK versus Germany, because they have a rolling programme.

Equally, I would make the point about sustainable aviation fuel. It may well be that that is the one to land on. My question to close is, shouldn’t the Government now start to lead and say, “Right, for this particular mode this is where we really need to focus. We are going to put everything on making it work because we cannot just delay and try and work out which one to go with”? Do you think that the Government need to be a bit more involved, not just in the setting of the targets but in actually making the winner deliverable?

Ed Birkett: Going back to the point I raised earlier about infrastructure, the infrastructure is absolutely key in all of this. We have seen the Government taking the lead on EV charging. They have to publish the strategy and we have to see that deployed.

For trains, it looks like a similar amount of the work has been done in terms of Network Rail identifying the options. It seems pretty clear that there is going to be a lot more electrification on the UK train network. That seems pretty clear. It does not seem like there is much regret in that, so I would agree with you.

Q108 **Chair:** Nina, do you have anything to close on that one?

Dr Skorupska: Infrastructure is key in getting the decision making and the alignment of the people who are engaged in delivering our electricity infrastructure. That is absolutely fundamental to enable the Government to be able to say, “Yes, this is the course of action.” They have said that for EV charging infrastructure, which is now being worked on and accelerated. I think they really need to commit to supporting it now for rail.

Ed Birkett: There is just one more thing, which is on the recent changes in the integrated rail plan. I know you have an inquiry on that. For me, one question that is really interesting is, what is the impact of that plan on freight and the ability of the network to carry freight?

Chair: Indeed. Louise made the point that with some of the other shifts freight will perhaps become even more important than it is right now.

Excellent. Ed and Nina, as ever, thank you so much for the evidence that you have given us. I hope that you will follow our inquiry through to its recommendations. I wish you a good rest of the day.



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